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Summary

When presented with a horse in acute abdominal distress the practitioner must choose between various medical or surgical treatments. This decision should be based on the patient's history, the results of a thorough systemic examination, clinical pathology findings, and the response to various treatments. The ability to evaluate and use this data to institute the proper regimen of therapy early in the course of the disease will help to increase the chances of recovery.

Introduction

The acute abdominal crisis in the equine may arise from sources other than the gastrointestinal tract. Hepatitis, peritonitis, renal disease, uterine torsion, and rupture of the urinary bladder, as well as other conditions, should all be considered in the differential diagnosis. It is necessary that the practitioner make a systematic examination of the animal in order to accurately assess its condition and to begin the proper therapeutic measures. While a specific diagnosis is desirable, it is often necessary to institute therapy on the basis of the presenting clinical signs, yet remain flexible in response to changes in the patient's condition.

Discussion

A complete history can be helpful in determining the cause of a colic. While observing the animal from a distance, one can question the owner about the feed and feeding program the horse is on, the parasite control measures regularly taken, the horse's age, previous episodes of colic, any injuries, recent breeding (especially if the patient is a mare), the possibility of other affected animals on the premises, and the ability to defecate. The history should also include the owner's characterization of the pain: the duration, degree, and whether or not it is intermittent or continuous.

The effects of *Strongylus vulgaris* larva migration on the anterior mesenteric artery and branches have been described.(1) An occlusive thrombosis of a large artery supplying a large segment of the gut will result in severe pain, rapid intoxication, shock, and death. Less severe signs may also be seen with thromboembolic colic, where smaller portions of the intestine are involved and the possibility for the establishment of collateral circulation exists.

While the ability to palpate the anterior mesenteric artery *per rectum* is dependent on the size of the horse and of the practitioner, it is often possible to palpate the ileocecocolic branch at the level of the hilus of the left kidney. One may discern fremitus or enlargement of the artery indicative of a verminous aneurysm. A history of infrequent wormings and recurrent colics should lead one to suspect a verminous arteritis as the cause of the colics.

Certain colics are age related, and this may be used to help determine the cause. Meconium impactions are common in the neonate. Younger horses are more prone to ascarid impactions, intussusceptions, torsion of the small intestine, and strangulating hernias (9, 18, 21). Conversely, older horses are more likely to develop pedunculated lipomas, traumatic hernias, neoplasms, impacted cecum, and large colon torsions (21).

If other horses on the premises are or have

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been affected with a similar episode of colic, one should consider a toxicosis. There are instances of horses acquiring a colic when grazed in a particular pasture, which suggests the presence of poisonous plants (12).

The presence of feces cannot be used to rule out an obstructive condition. A horse may defecate up to 12 hours after the occurrence of an obstruction, so one must not be too hasty in eliminating that possibility (6). However, fecal elimination will cease very quickly when there is necrosis of the bowel wall.

Pain is a very important diagnostic and prognostic tool. Some generalizations may be made which can help to localize the offending lesion. Pain originating from the anterior portion of the intestinal tract (stomach and small intestine) is usually more severe and unrelenting than pain arising from the cecum and colon. Obstructive lesions (volvulus, torsion, intussusception) result in a similar severe type of pain. Impactive lesions, while also severe, generally yield an intermittent pain as the bowel attempts peristalsis. Spasmodic colic, often due to indigestion or minor thromboembolic episodes, also produces an intermittent type of pain. While it is important to control the pain and prevent the animal from injuring itself or its handlers, one should try to avoid masking the pain completely before making some kind of decision as to its source. If pain can be controlled only temporarily or not at all with agents such as phenylbutazone, dipyrone, or pentazocine, the horse is more likely to be a good surgical candidate.

The physical examination of the horse can begin while the history is being taken. Observe the abdomen for distension. Since the stomach and small intestines are confined within the rib cage, they are not likely to cause abdominal distension. Severe pain with no distension would suggest a small intestinal or gastric lesion. The presence of dyspnea without distension would indicate gastric dilatation, the dyspnea due to pressure exerted on the diaphragm by the dilated stomach. Gastric dilatation may be primary, or it may be secondary to an obstructed or displaced small intestine. The ability to repeatedly drain fluid and gas from the stomach suggests a secondary rather than primary dilatation.

A closer examination of the patient would include checking for proper dentition. Malocclusion and a sore mouth can prevent the proper mastication of food and possibly result in an impaction.

While at the head, one should note the color of the mucous membranes, the capillary refill time, and character and rate of the pulse. Injected mucous membranes can indicate an obstructive lesion, while muddy mucous membranes may mean an impaction is present. Normally, the capillary refill time should be less than three seconds (5, 23), but serial values are of more significance than a single measurement. A rapid, thready pulse may indicate the onset of endotoxic shock and circulatory failure. Cool extremities (for example, the ears and muzzle) also indicate circulatory collapse.

A physical examination is not complete without auscultating all quadrants of the abdomen. Small intestinal sounds (or the absence of them) are noted on the left hand side, dorsally. The large intestine occupies the ventral left abdomen and the right hand side. Hypermotility, alternated with intervals of relative quiescence, is typical of spasmodic colic. Impactions will also exhibit intermittent borborygmi, but pain will generally be more severe and continuous than that seen in spasmodic colic. A silent abdomen should be cause for concern, and may accompany shock, obstruction, or massive infarction. A cycle may be established where visceral pain, due probably to ischemia, results in catecholamine release, resulting in increased bowel ischemia and even more pain (7). The presence of gas or fluid distension may be discerned (24). Auscultating and percussing may demonstrate fluid in the peritoneal cavity, as will ballottement, indicating the possibility of a ruptured urinary bladder.

The stomach tube can be a valuable aid to diagnosis. If it is impossible to enter the stomach with the tube, gastric dilatation with spasm of the cardiac sphincter should be considered. The repeated ability to drain gas, fluids, and previously administered medicaments from the stomach indicates a high intestinal obstruction. The tube may be used to approximate the consistency and amount of material within the stomach (12). The pH of normal gastric fluid is 4-5, while fluid from intestinal regurgitation has a pH of 7-8 (23).

A rectal examination is indicated in all acute colics. However, in some cases it may be impossible to adequately restrain the patient so that a rectal may be safely performed. One should cautiously attempt to palpate all structures within reach. In the mare, one may note the presence of a uterine torsion. The internal inguinal rings in a stallion should be palpated to determine if any bowel has passed through them (5).

Fluid or gas filled loops of small diameter intestine in the central abdomen accompanies obstruction of the small intestine (24). The doughy mass of an impacted cecum may be felt in the right abdomen. A torsion of the large colon (more common with the left colon due to its lack of attachments) may be palpated, as can the displaced or impacted pelvic flexure. Taut mesentery, indicating a displacement of the jejunum, can often be palpated.

The most commonly used laboratory aids to colic diagnosis are packed cell volume and plasma protein. Both measure the hydration status of the animal. It is best to consider both values together, as PCV may increase in response to catecholamine release (23) or splenic contraction (17). Rising PCV and PP indicate hemoconcentration and the development of shock, with visceral pooling of blood. Blood lactate level (9, 16) shows great promise as a prognostic indicator, but due to difficulties in measurement its determination is presently rarely done by most laboratories.

Abdominal paracentesis can provide valuable information as to what is occurring within the peritoneal cavity, especially if the practitioner is able to become familiar with normal and abnormal values through experience. The technique itself has been adequately described by others (11, 19). The normal values for equine peritoneal fluid are contained in Table I.

Indications for abdominal paracentesis include pain persisting for over two hours, a persistent heart rate over 80, CRT greater than 2.5 seconds, toxic mucous membranes, and hypomotility of the intestine. The results should be interpreted in light of the history and clinical signs.

Normal peritoneal fluid should be clear and straw colored. Amber colored fluid indicates an excessive number of erythrocytes, suggesting an infarction or devitalization of the gut wall and loss of RBC's (9, 21). Peritonitis will be accompanied by a yellow, turbid fluid with a high number of neutrophils and bacteria. The presence of ingesta means that the bowel has been penetrated during sampling or that rupture has occurred. Fluid from the bowel lumen usually has a lower cell count than that found free within the abdominal cavity (21). Frank blood indicates puncture of the spleen or of a blood vessel. Large numbers of lymphocytes indicate lymphosarcoma.

Perhaps more important than the diagnosis of the specific condition causing an acute abdominal crisis is the early determination of whether the patient is a surgical candidate. It is essential that those horses requiring surgery be operated upon early in the course of the disease, before irreversible morphocellular damage and endotoxic shock occurs. Through fluid, antibiotic, and steroid therapy, it is possible only to delay, not prevent, the development of shock in the equine (9).

Most surgical colics are those involving an intestinal displacement or an impaction unresponsive to medical treatment (5).

It is possible that a non-surgical colic may become one during the course of the disease. For example, an impacted large intestine may become a torsion as the horse rolls in pain (25).

The following criteria may be helpful in determining the necessity for surgery: sudden onset, violent pain that is refractory to treatment, rapidly rising PCV, PP, CRT, the complete absence of borborygmi, findings on rectal palpation suggestive of intestinal displacement or obstruction, and a pathological change in peritoneal fluid.

A pulse of over 60 and rising is a good general cut off point at which one should consider preparing for surgery (18). However, it is always important to interpret individual values with other clinical findings. A PCV of 45% but with a pulse of 80, lack of response to treatment, and rectal findings suggesting a pathological condition indicate a probable surgical case (13).

If a horse is suffering from a diffuse peritonitis, has ruptured the bowel some time before examination, or is in terminal shock, one should avoid surgery, as the results can only be unfavorable (25). It follows that the sooner one can diagnose the presence of a surgical condition and commence operating,

the greater are the chances of a successful outcome.

Antibiotic and supportive therapy for shock should be instituted prior to transportation in the horse that has been diagnosed as a surgical candidate and must be taken to a clinic or hospital.

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